

Scope Splitting in Syrian Arabic

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Abstract

Sentences like *Mary needs to make the fewest mistakes on the upcoming test* have a ‘split scope’ reading roughly paraphrasable as ‘Mary exceeds all others in terms of how many mistakes she must *not* make’, that is, her situation is the most precarious. The structural approach to this phenomenon attributes to such sentences a logical form resembling this paraphrase, in which the superlative component of the meaning of *fewest* scopes above the modal *need to* and the negative component scopes below it. This paper investigates the translational equivalents of such sentences in Syrian Arabic, a language in which superlatives may be displaced from their scalar associates in the surface order to some extent. The syntax of such expressions in Syrian Arabic, and the range of interpretations available to the various syntactic permutations found there sheds light on the nature of scope splitting. Contrary to the structural approach, the Arabic facts point to the conclusion that split scope readings of such sentences arise from an ambiguity in the meaning of the modal verb itself, rather than from a syntactic distinction in logical form.

1 Introduction

Superlative *least* displays an ambiguity with respect to universal modals like *need to* that has been analyzed as a syntactic ambiguity. Suppose that Mona has done relatively poorly in her class and a poor grade on an upcoming test will scuttle her chances of passing. In fact, she can afford to make no more than two mistakes on the upcoming test, fewer than anyone else in the class can afford to make. (1a) is judged true in this situation. On the model of decompositional analyses of the comparative (Rullmann 1995, Heim 2006, Buring 2007a), Stateva (2000) proposes that this reading of examples like (1a) has a logical form in which the superlative component of *fewest* has moved over the modal but the negative component, in the form of *few*, has stayed behind, as illustrated in (1b). I refer to this kind of analysis as a ‘scope splitting’ analysis.

- (1) a. Mona needs to make the fewest mistakes.
- b. Mona -est_d needs to make *d*-few mistakes.

Few by itself seems to also show a kind of scope splitting. (2a) can be read as synonymous

with (2b), where Mona has done so well in the class that she doesn't need to study very much for the coming test. Here, *little* (the mass counterpart of *few*) splits into a negative component that has scope above the modal and a component synonymous with *much* (the mass counterpart of *many*) that occurs below it.

- (2) a. Mona needs to study very little.
b. Mona does not need to study very much.

In this paper, I investigate the counterparts of both kinds of sentences in Syrian Arabic, which provides a unique window to the inner workings of the phenomenon because it allows overt displacement of superlatives and systematic surface variation in the position of negation. By manipulating these parameters, it is possible to test the generality of analyses of this phenomenon. It will turn out that the literal scope splitting analysis, in which the components of the negative degree quantifier (*few/little* or *fewest/least*) split apart at LF and have differential scope with respect to a modal at LF, does not capture the full range of facts in Arabic. After investigating two kinds of structural scope splitting analyses, I propose that the ambiguity in question is in fact due to an optionality in the interpretation of the universal modal verb in such contexts. The counterpart of *need to* in Arabic may be interpreted as an existential modal in the scope of negation, strengthening the meaning of the sentence as a whole. With some additional restrictions, this analysis extends to English, while the scope splitting analysis of English does not extend to Arabic.

After making some methodological remarks in section 2, I discuss *?alil* 'little/few' in Syrian Arabic in section 3 and find evidence supporting an analysis along the lines of Heim's (2006) analysis of the English counterpart, that decomposes *little/few* into a degree predicate negator and a positive component corresponding to the meaning of *much* in (2b). But these components do not have differential scope. Section 4 discusses scope splitting of superlative *a?all* 'least/fewest' across a modal verb in Syrian Arabic. I claim that *a?all* consists of a superlative morpheme and the same degree predicate negator found in *?alil* 'little/few'. But parallels in the interaction of the universal modal with *a?all* and with clausal negation in

general reveal that the best explanation for the Arabic facts puts the source of the ambiguity in the modal verb itself, not in the syntax. Section 5 then returns to *ʔalīl* ‘little/few’ in light of the results of section 4.

2 Methodology

The empirical facts reported here were elicited from five native speakers of Syrian Arabic residing in the country the research was conducted in [not Syria; the non-anonymized version of this paper will provide more details]. Consultants are from the city of Damascus and so the facts reported here pertain to Damascene Arabic. The consultants are between the ages of 33 and 50 at the time of this writing, and have lived in the country in which the research was conducted for between four and 18 years. All had lived in Syria prior to that. The consultants were recruited through public advertisements seeking Syrian Arabic speaking volunteers for participation in a linguistic fieldwork study. They act in the capacity of volunteers but received a cost offset of €20 per hour provided for this purpose by national funding agency that financed this research (grant number ...). All the consultants have consented to the publication of the data they provide.

Elicitation sessions took place in the offices of the author’s home institution. Interviews were conducted by the author in Arabic. The elicitation adhered to guidelines in semantic field work described in detail in Matthewson 2004: all the judgments reported here are judgments of grammaticality, of the truth and/or felicity of a sentence in a specific context, or of (mutual) entailment or contradiction between Arabic sentences. The English translations of the example sentences presented here are the author’s assessment of optimal equivalence in English. The consultants did not judge translational equivalence.

3 *ʔalīl* ‘little/few’

The English quantity adjectives *many/much* and *few/little* have the counterparts *ktīr* and *ʔalīl* in Syrian Arabic (and other varieties), as illustrated in (3). Arabic does not distinguish selection for count and mass nouns as English does. Henceforth, I gloss *ktīr* as either ‘much’ or ‘many’ and *ʔalīl* as either ‘little’ or ‘few’ according to the context under consideration. When not discussing a particular example, I translate *ktīr* by default as ‘much’ and *ʔalīl* as ‘little’.

- (3) sāra ʔāwab-it ʃaħħ ʕala asʔile ʔalīl-e / ktīr-e b-^ol-faħʃ.
Sarah answered-3FS correctly on questions few-PL / many-PL on-the-test
‘Sarah answered few/many questions correctly on the test.’

The term *ʔalīl* ‘little’ interacts scopally with modal verbs. Consider the following situation. Sarah, Sami and Muna are in a class where they have to take two tests with 10 questions each. They need a combined score of at least 12 correct answers to pass the class, and have already taken the first test. The graph in (4) represents the results of the first test and their needs for the second test. The dark gray is the number of questions they got right on the first test. The medium gray is the number of questions they have to get right on the second test in order to reach the 12 they need to pass. The light gray is the number of mistakes they can afford to make on the second test before they fall below the 12 point cutoff line.

(4)

	Sarah	Sami	Muna
20			
19			
18			
17			
16			
15			
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2			
1			

Since she did well on the first test, Sarah only needs to get two questions right on the second test to pass the class, which is few, particularly in relation to the others' needs. The native speakers consulted for this study were presented with the diagram and (4) and the same verbal description of the context as above (albeit in Arabic), and were asked to repeat the description of the context to be sure they had understood. In this context, they judge (5a) to be true, although it is significantly less colloquial than the paraphrase in (5b), where negation occurs above the modal and *?alil* 'few' is replaced by *ktir* 'many'. Despite a substantial preference for the latter format (which I suspect is also quite pronounced among English speakers), Syrian Arabic speakers judge (5a) to be true whenever (5b) is and vice versa, meaning the two may be used to express the same proposition. Both correctly describe the situation depicted in (4), where Sarah does not need to answer many questions to pass the class, since she only needs to answer two. Example (5c) is judged grammatical but false in the situation in (4). It asserts that Sarah does not need to answer any questions at all to pass, but this is not the case; she needs to answer at least two. The fact that

(5a) is synonymous with (5b) and not (5c) suggests that *ʔalīl* ‘few’ in (5a) consists on some level of a negative component corresponding to *mū* ‘not’ in (5b) and a quantity adjective corresponding to *ktīr* ‘many’ in (5b), and that the negative component can be interpreted above the modal, where *mū* occurs in (5b). If *ʔalīl* ‘few’ corresponded only to negation, we would expect (5a) to be synonymous with (5c) contrary to fact.

- (5) a. *sāra lāzim t-ʔāwīb ʃahh ʔala asʔile ʔalīl-e -b^ol-faḥṣ t-tāni.*
 Sarah must 3FS-answer correctly on questions few-PL on-the-test the-second
 ‘Sarah needs to answer few questions correctly on the second test.’
- b. *sāra mū lāzim t-ʔāwīb ʃahh ʔala ktīr asʔile b^ol-faḥṣ t-tāni.*
 Sarah not must 3FS-answer correctly on many questions on-the-test
 t-tāni.
 the-second
 ‘Sarah doesn’t need to answer many questions correctly on the second test.’
- c. *sāra mū lāzim t-ʔāwīb ʃahh ʔala asʔile b^ol-faḥṣ t-tāni.*
 Sarah not must 3FS-answer correctly on questions on-the-test the-second
 ‘Sarah doesn’t need to answer any questions correctly on the second test.’

Klima (1964), Barwise and Cooper (1981), McNally (1998) and Solt (2006) claim that *little* and *few* result from an optional fusing of negation with *much* and *many* respectively. Klima (p. 276) points to the parallel between the two conjunct clauses in (6) as evidence for this proposal.

- (6) a. Little rain fell, and neither did much snow.
 b. Few writers accept suggestions, and neither do many publishers.

Klima claims that *neither* is itself the fusion of negation and *either*. Example (6a) establishes a parallel between *little rain* and *not...much snow*, which suggests that *little* consists on some level of the component parts *not much*. The same reasoning applies to *few*. Solt (2006) points to pairs like the examples in (7) as evidence that the two components may have distinct scope with respect to a modal verb at LF (her example (16), p. 383). This is the same phenomenon we see in Arabic in (5)

- (7) a. They need few reasons to fire you.
 b. They do not need many reasons to fire you.

One approach to the synonymy of (7a) and (7b) (on the relevant reading of (7a)) is developed in detail in McNally (1998) and Solt (2006). McNally proposes that *few* (and *little*) has the meaning of *many* (or *much*), but is subject to the condition on its distribution that it must occur in the scope of a negative operator. This operator is covert in standard English; dialects in which it is overt display negative concord (Ladusaw 1992). McNally proposes to treat *no* as in *There were no cookies left* in the same way, as a negative existential claim where negation has wide scope. Solt proposes a variation on this analysis where the negation associated with *few* is part of its lexical entry, but is stored until a point in the derivation at which a type *t* constituent is derived, meeting the type requirement of negation, at which point negation is inserted. She does not treat *no* explicitly but draws a parallel between her analysis and Jacob’s (1980) analysis of German *kein* ‘no’ along similar lines.

There are reasons to be skeptical of an analysis along these lines for Arabic *?alīl* ‘little’. Like the negative concord languages that Ladusaw (1992) discusses in the analysis that McNally’s analysis of *few* and *no* is based on, Syrian Arabic requires a negative quantifier in object position to be licensed by clausal negation (Cowell 1964, p. 391, Alqassas 2018). The negative quantifier *wala* ‘no’ combines with a singular NP.¹ In subject position, it is incompatible with the clausal negation particle *mā* ‘not’, which directly precedes the finite verb, as (8a) shows. Elsewhere, however, *wala NP* must be c-commanded by clausal negation, as (8b) and (8c) show. Example (8d) shows that *?alīl* ‘few’ does not pattern together with *wala* in this respect. It is not a ‘negative quantifier’.² Note that the clausal negation that surfaces as *mū* in (5) surfaces as *mā* in (8). These two particles are allomorphs of each other; *mā* occurs before a verb and *mū* elsewhere (Cowell 1964, p. 386). There is no difference in meaning. The modal *lāzim* ‘must’ in (5) is morphologically an active participle

¹The particle *wala* is separable from its restriction NP to an extent. When the NP occurs in a prepositional phrase, *wala* occurs external to the prepositional phrase, as (8c) illustrates. In this respect it has the same distribution as *ḥatta* ‘even’. I restrict my attention here to *?alīl* and do not provide an analysis of negative quantifiers, if that is what *wala NP* is.

²The negation in (8a) and (8d) is not strictly speaking ungrammatical, but is not interpreted as a licenser for *wala ḥada* and *?alīl* respectively but rather as an independent negator. If it is present, a double negative reading arises. Examples (8b) and (8c), in contrast, are interpreted with a single negation; one of the two negative morphemes is vacuous.

and therefore is usually negated with *mū*, though its distribution is similar to a verb and accordingly is negated by some speakers with *mā*, an apparent case of grammaticalization-in-progress. When referring to clausal negation in general, I use the morpheme *mā*, though this sometimes manifests itself as *mū*.

- (8)
- a. wala ḥada (*mā) řařa war^od la-sāra.
no one (*not) gave flowers to-Sarah
'No one gave flowers to Sarah.'
 - b. nādiya *(mā) řaři-t wala ři la-sāra.
Nadia *(not) gave-3FS no thing to-Sarah
'Nadia gave nothing to Sarah.'
 - c. nādiya *(mā) řaři-t war^od wala la-ḥada.
Nadia *(not) gave-3FS flowers no to-one
'Nadia gave flowers to no one.'
 - d. nādiya (*mā) řaři-t war^od řalīl la-sāra.
Nadia *(not) gave-3FS flowers few to-Sarah
'Nadia gave few flowers to Sarah.'

Even in English, observations that have motivated analyses of *no* that equate it with clausal negation do not extend to *few*. Klima, for example, suggests on the basis of (9) that the object quantifier *no one* is parallel to *not... anyone*, where the negative component climbs over the matrix verb at LF.

- (9)
- a. I will force you to marry no one, and neither will he.
 - b. I will not force you to marry anyone, and neither will he.

But the pattern in (9) is not replicated with *few*, as (10) shows.

- (10)
- a. *I will force you to read few books for this class, and neither will Prof. Jones.
 - b. I will not force you to read many books for this class, and neither will Prof. Jones.

These facts militate against an analysis that inserts clause-level negation in the interpretation of *few*, by whatever mechanism. Such analyses predict that *few* will pattern together with counterpart sentences with clausal negation, like *no* does, but this prediction is not borne out in either Arabic or English. Alternatively, Heim (2006) presents an analysis that does not unify the behavior of *few* and *no* and extends fruitfully to Arabic, which is es-

essentially identical to English as far as *ʔalīl* ‘little’ goes (but which differs when we turn to superlatives in the next section). Heim claims that English *little* has the meaning that I attribute to *ʔalīl* in (11a) (see also Büring 2007a,b), but, following Cresswell (1976), occurs by default in combination with a positive operator POS with the meaning that von Stechow (2009) attributes to it in (11b). The symbol L_c denotes a degree interval representing the neutral range for the degree property P in a context c .

- (11) a. $\llbracket \text{ʔalīl ‘little’} \rrbracket = \lambda P_{\langle d,t \rangle} \lambda d_d. \neg P(d)$ (Heim 2006, Büring 2007a,b)
 b. $\llbracket \text{POS} \rrbracket^c = \lambda P_{\langle d,t \rangle}. L_c \subseteq P$ (Heim 2006, von Stechow 2009)

On the model of Heim’s (2006) analysis of English, POS combines with *ʔalīl*, and the constituent so formed moves from a base position adjacent to its scalar associate—the plural noun *asʔile* ‘questions’ in (5a), to a position above the modal. Movement goes hand in hand with abstraction over a degree variable in the base position of $[\text{POS } ʔalīl]$ representing the degree argument of the plural. Subsequently, POS raises further, leaving a degree-denoting trace, as illustrated in (12). In this diagram and others to follow, the subject variable x occurs in its canonical post-verbal position.

- (12) $\bar{s}ara \quad \lambda x \text{ POS } \lambda d [d \text{ ʔalīl}] \lambda d' \bar{l}āzim \text{ t}zāwib \ x \ \text{ṣ}ahḥ \quad \text{ʔala } d' \text{-asʔile}$
 Sarah POS few must answer correctly on questions
 ‘Sarah must answer few questions correctly.’

The LF in (12) denotes the formula in (13), where the negation contributed by *ʔalīl* scopes over the universal quantifier over worlds contributed by the modal verb *lāzim*. Note that the universal modal ‘ \square ’ contributed by *lāzim*, which can variously be translated into English as ‘must’, ‘should’ or ‘need to’, has an implicit restriction on the set of worlds it quantifies over which is not notated here. We are talking about what Sarah needs to do to pass the class, so the universal quantifier that *lāzim* introduces ranges over worlds in which Sarah passes the class. The formula ‘questions(x, d)’ here and below is to be read ‘ x is a plurality of questions with cardinality d ’.

- (13) $L_c \subseteq \lambda d \neg \square \exists x \text{ answer-correctly}(\text{Sarah}, x) \ \& \ \text{questions}(x, d)$

The second term of the subset relation in (13) is the set of degrees such that it is not necessary for Sarah to get that many questions right to pass the class. In the context in (4), Sarah has to get two questions right, but not necessary three or more. So this set is the set $\{3, 4, 5, 6, 7, 8, 9, 10\}$. The formula in (13) is saying that the neutral range for getting questions right, say 5 or 6, is in that set. This has the consequence that the two questions Sarah needs to get right to pass are below the neutral range, and therefore ‘few’.

The adjective *ʔalīl* as used in positive contexts is a derivative of POS, which negative quantifiers like *wala ḥada* ‘no one’ are not. Consequently, this analysis does not draw any parallels between the behavior of *ʔalīl* and that of quantifiers like *wala ḥada* that trigger clausal negation. Whether we treat *wala ḥada* along the lines that McNally (1998) suggests for English *no one*, where it is analyzed as a variant of *someone* that must occur under clausal negation, or as a generalized quantifier (Barwise and Cooper 1981) that triggers negative concord, there is no similarity between *wala ḥada* and *ʔalīl* as defined in (11a), which makes it a degree predicate modifier.

I conclude that Heim’s analysis of English *little* captures the English facts better than the split scope analysis, and extends well to Syrian Arabic *ʔalīl* ‘little’, which behaves the same as its English counterpart. However, *aʔall* ‘least’—the superlative derivative of *ʔalīl*—functions rather differently in Arabic than its English counterpart and sheds new light on the proper analysis of split scope phenomena as they pertain to superlatives, e.g. (1) above. The following section investigates superlative *aʔall* in detail.

4 *aʔall* ‘fewest/least’

Superlative adjectives are formed in Syrian Arabic by putting the base adjective into the relative prosodic template $aC_1C_2aC_3$, by mapping the root consonants of the adjective into the consonant slots C_1 - C_3 of the template. In this manner, *aʔrab* ‘nearest’ is derived from *ʔarīb* ‘near’, *aṣʔab* ‘most difficult’ from *ṣaʔib* ‘difficult’, *abrad* ‘coldest’ from *bārid* ‘cold’,

etc. On this model we also have *aktar* ‘most’ from *ktīr* ‘much’ and *aʔall* ‘least’ (underlyingly *aʔlal*, which a regular metathesis rule converts to *aʔall*) from *ʔalīl* ‘little’. I refer to the morpheme expressed by this template as ‘ACCAC’ and gloss it as ‘est’.

Unlike other adjectives, superlative adjectives typically precede the noun they modify in Syrian Arabic, as illustrated in (14a) (Cowell 1964, p. 313).³ Such noun phrases are morphologically indefinite, and display the same ‘absolute’ and ‘relative’ readings the English counterparts display (Hallman 2016). On the absolute reading of (14a), Nadia has solved the hardest problem from some pre-given set of problems. On the relative reading, we compare Nadia to other individuals in terms of how hard the problems they solved were. Depending on who we are comparing, the problem she solved might not have been the absolute hardest problem in the context. See Szabolcsi (1986) and Heim (1999, 2001) for arguments that these two readings are represented by distinct logical forms. Heim relies for this purpose on so called ‘upstairs de dicto’ readings of superlatives described in detail below.

- (14) a. *nādiya ḥall-it aṣḥab masʔale.*
 Nadia solved-3FS hardest problem
 ‘Nadia solved the hardest problem.’

On the model of (14a), we expect quantity superlatives to have the form in (15), but (15) is judged ungrammatical.

- (15) **nādiya ḥall-it aktar masāʔil.*
 Nadia solved-3FS most problems
 (‘Nadia solved the most problems.’)

Rather, the superlative of quantity is expressed by the adverbial superlative. The adverbial superlative is formed by combining a superlative adjective with the dummy noun *wāḥid*

³It is strictly speaking the superlative template that occurs prenominal in such examples; the adjective raises from its basic post-nominal position and fuses with it. We know this because raising is optional: the superlative template can be fleshed out instead with the pleonastic morphological host *ktīr* ‘much’, while the adjective stays in situ, making (i) an alternative expression of (14a).

- (i) *nādiya ḥall-it aktar masʔale ṣaḥbe.*
 Nadia solved-3FS most problem hard
 ‘Nadia solved the hardest problem.’

‘one’ or *waḥd-e* ‘one-FEM’ (underlyingly *wāḥide*) according to the gender of the subject of comparison (when the subject of comparison is human, otherwise *fi* ‘thing’ is used for this purpose, though particularly in rural dialects *fi* has generalized to humans as well). The two sentences in (16) are unambiguous. (16a) is judged to be synonymous with (17a), which explicitly states that Nadia loves the football star Mohammad Sallah more than she loves anyone else. (16b) is judged to be synonymous with (17b), which explicitly states that Nadia loves Mohammad Sallah more than anyone else loves him; she is his greatest fan. In the first case, where *wāḥid* occurs in the masculine form (16a), Mohammad Sallah is the subject of comparison, and in the second case, where *waḥde* occurs in the feminine form (16b), Nadia is the subject of comparison.

- (16) a. *nādiya b-^ot-ḥibb ^omḥammad ṣallāḥ aktar wāḥid.*
 Nadia IND-3FS-love Mohammad Sallah most one
 ‘Nadia loves Mohammad Sallah the most.’
- b. *nādiya b-^ot-ḥibb ^omḥammad ṣallāḥ aktar waḥd-e.*
 Nadia IND-3FS-love Mohammad Sallah most one-FS
 ‘Nadia loves Mohammad Sallah the most.’
- (17) a. *nādiya b-^ot-ḥibb ^omḥammad ṣallāḥ aktar mim-ma b-^ot-ḥibb ayy*
 Nadia IND-3FS-love Mohammad Sallah more than-that IND-3FS-love any
ḥada tāni.
 one other
 ‘Nadia loves Mohammad Sallah more than she loves anyone else.’
- b. *nādiya b-^ot-ḥibb ^omḥammad ṣallāḥ aktar mim-ma ayy ḥada tāni*
 Nadia IND-3FS-love Mohammad Sallah more than-that any one other
b-yi-ḥibb-u.
 IND-3MS-love-him
 ‘Nadia loves Mohammad Sallah more than anyone else loves him.’

Like other adverbs, the position of superlative *aktar wāḥid(e)* is flexible, as the synonymous examples in (18) show (other word orders are available as well). These examples illustrate the superlative of quantity, as well as the generalization, more evident in (18b) than (18a), that the superlative may be structurally separated from its scalar associate in Syrian Arabic.⁴

⁴The dependency between the superlative and its scalar associate cannot cross over a DP boundary (Hallman 2016). For this reason, adverbial *aktar wāḥd-e* ‘most one-FS’ in (18) can associate with the

- (18) a. nādiya ḥall-it masāʔil aktar waḥd-e.
 Nadia solved-3FS problems most one-FS
 ‘Nadia solved the most problems.’
 b. nādiya aktar waḥd-e ḥall-it masāʔil.
 Nadia most one-FS solved-3FS problems
 ‘Nadia solved the most problems.’

The material that may separate *aktar wāḥid(e)* from its scalar associate may include modal verbs, as illustrated in (19), and, as we will see later, negation. Arabic speakers judge (19) to be true in the context illustrated in (4), in which Muna is ‘greatest’ in terms of how many questions she must answer correctly on the second test in order to get a total of 12 or more correct answers and pass the class. To be exact, she needs to answer at least eight questions right, and no one else needs to get that many right. Consequently, (19) has what Sharvit and Stateva (2002) call an ‘at least upstairs de dicto reading’. It is ‘at least’ because we are talking about the least number of questions each participant must get right, ‘upstairs’ because the superlative is interpreted above the modal, i.e., we are comparing the participants’ needs, and ‘de dicto’ because there are no particular questions the participants have to answer correctly, only a particular quantity.

- (19) muna aktar waḥd-e lāzim t-ḡāwib ṣaḥḥ ʔala asʔile b-^ol-faḥṣ
 Muna most one-FS must 3FS-answer correctly on questions on-the-test
 t-tāni.
 the-second
 ‘Muna needs to answer the most questions correctly on the second test.’

The surface word order seen in (19) corresponds roughly to the logical form attributed to the English translation of (19) in the movement analysis of the superlative, such as Heim (1999, 2001) and elsewhere. Drawing on Heim (1999, 2001, 2006), I define the meaning

plurality of the object *masāʔil* ‘problems’ but not with an adjective modifying that object, even if it is gradable, as (i) shows (rather, you say (14a)). I therefore focus in what follows on the quantity superlative, where the superlative can felicitously be separated from its scalar associate.

- (i) *nādiya aktar waḥd-e ḥall-it masʔale ṣaʔibe.
 Nadia most one-FS solved-3FS problem difficult
 (‘Nadia solved the most difficult problem.’)

of the superlative template as in (20). I assume the meaning of the adverbial superlative *aktar wāḥid(e)* is just the meaning of the underlying superlative morpheme ACCAC and that *wāḥid(e)* plays no semantic role. The morpheme ACCAC is fleshed out with the adjectival base *ktīr* ‘much’ by default, whose function is pleonastic in this case. I expand on this matter in section 5.

$$(20) \quad \llbracket \text{ACCAC} \rrbracket = \lambda R_{\langle d, \langle e, t \rangle \rangle} \lambda x_e . \{d \mid R(x, d)\} \supset \{d \mid \exists x' \neq x R(x', d)\}$$

Example (21) represents a sketch of the semantic composition of (19). The superlative morpheme (together with vacuous *waḥd-e* ‘one-FS’) applies to the relation between a degree d and individual x with the truth condition that x must answer d questions correctly. This combination results in a predicate of individuals, which is true of Muna in the situation in (4).

$$(21) \quad \begin{array}{llllll} \text{muna ACCAC waḥde } \lambda d \lambda x \text{ lāzim t} \dot{z} \text{āwib } x \text{ ṣaḥḥ} & \text{ʔala } d \text{-asʔile} \\ \text{Muna est} & \text{one} & \text{must answer} & \text{correctly on} & \text{questions} \end{array}$$

This LF composes as the formula in (22).

$$(22) \quad \{d \mid \Box \text{Muna answers } d\text{-questions correctly}\} \supset \{d \mid \exists x \neq \text{Muna } \Box x \text{ answers } d\text{-questions correctly}\}$$

This formula is true when the set of degrees such that Muna answers that many questions right in all possible worlds in which she passes the test⁵ is a superset of the set of degrees such that anyone else answers that many questions right in all the worlds in which they pass. Assuming that degree descriptions are downward monotonic (Seuren 1973, Heim 1999), the set of degrees meeting the description ‘Muna answers that many questions right in all the worlds in which she passes the class’ is the set $\{1, 2, 3, 4, 5, 6, 7, 8\}$. The corresponding sets for Sami and Sarah are $\{1, 2, 3, 4, 5, 6\}$ and $\{1, 2\}$ respectively. Muna’s degree set is indeed a superset of each of the others, and so the claim comes out true in the context in (4), which matches native speaker judgments for (19).

⁵As mentioned previously, the modal operator \Box is restricted by an accessibility relation that in this case limits the possible worlds under consideration to those in which Muna passes the class. For readability’s sake I leave this accessibility relation implicit.

Superlative *aktar* ‘most’ can be replaced with its antonym *aʔall* ‘least’ anywhere *aktar* is found, preserving grammaticality. For example, native speakers judge (23) to be true in the situation in (4), like the sentence with *aktar* in (19). While (19) describes Muna’s situation, (23) describes Sarah’s situation.

- (23) s̄ara aʔall waḥde lāzim t-ʔāwib ʃaḥḥ ʕala asʔile b-ʔl-faḥṣ
 Sarah least one-FS must 3FS-answer correctly on questions on-the-test
 t-tāni.
 the-second
 ‘Sarah needs to answer the fewest questions correctly on the second test.’

The sentence in (23) with *aʔall waḥde* ‘least one’ is judged to be synonymous with the sentence in (24) with *aktar waḥde* and negation over the modal verb *lāzim*. Here, *aʔall waḥde* ‘least one’ is split apart into *aktar waḥde* and negation, preserving meaning.

- (24) s̄ara aktar waḥde mū lāzim t-ʔāwib ʃaḥḥ ʕala asʔile b-ʔl-faḥṣ
 Sarah most one-FS not must 3FS-answer correctly on questions on-the-test
 t-tāni.
 the-second
 ‘Sarah needs to answer the fewest questions correctly on the second test.’

The LF for (24) parallel to (21) for (19) is shown in (25).

- (25) s̄ara ACCAC waḥde λdλx mū lāzim tʔāwib x ʃaḥḥ ʕala d-asʔile.
 Sarah est one not must answer correctly on questions

This LF yields the denotation in (26).

- (26) $\{d \mid \neg \Box \text{Sarah answers } d\text{-questions correctly}\} \supset \{d \mid \exists x \neq \text{Sarah } \neg \Box x \text{ answers } d\text{-questions correctly}\}$

Recall that in the situation in (4) there are ten questions on the second test. It is necessary for Sarah to answer two questions correctly on the second test to pass the class. It is not necessary for her to answer three questions correctly, or four or five, or all ten. So the set of degrees such that it is not necessary for her to answer that number of questions correctly is the set $\{3, 4, 5, 6, 7, 8, 9, 10\}$. The set of degrees such that it is not necessary for Sami to answer that number of questions correctly is $\{7, 8, 9, 10\}$, and for Muna $\{9, 10\}$.

Since Sarah’s set is a superset of the other two, the claim in (26), representing the meaning of (24), is true.

The denotation of (24) is the expected one given the order of elements in that sentence. The fact that (23) with *aʔall waħde* ‘least one’ is judged synonymous with (24) with *aktar waħde mū* ‘most one not’ could be taken to suggest that it consists of the same components in the same order: *aʔall* is really the superlative ACCAC together with a negative morpheme in the form of the adjective *ʔalīl* rather than clausal negation. If we are able to treat the constituent *lāzim tʔāwib ʔaħħ ʔala asʔile* ‘must answer questions correctly’ as a degree predicate (perhaps by virtue of movement of *ʔalīl* to its edge), we can give *ʔalīl* scope over the modal. (27) represents this initial step in the derivation of (23) according to this idea.

(27) ʔalīl λd lāzim tʔāwib sāra ʔaħħ ʔala d-asʔile
 few must answer Sarah correctly on questions

Adding ACCAC *waħde* here derives (28), a structure in which ACCAC *waħde* and *ʔalīl* are adjacent, so that the morphological fusion operation may apply that inserts the root consonants of *ʔalīl* into the prosodic template ACCAC (not shown).

(28) ACCAC waħde ʔalīl λd lāzim tʔāwib sāra ʔaħħ ʔala d-asʔile
 est one few must answer Sarah correctly on questions

Raising the subject, accompanied by abstraction over a variable in the subject argument position, derives (29).

(29) sāra λx ACCAC waħde ʔalīl λd lāzim tʔāwib x ʔaħħ ʔala d-asʔile
 Sarah est one few must answer correctly on questions

Finally, movement of the superlative phrase ACCAC *waħde* over the subject abstraction index corresponding to λx in (29), accompanied by abstraction over a degree variable trace of movement, yields (30).

(30) sāra ACCAC waħde λd'λx d' ʔalīl λd lāzim tʔāwib x ʔaħħ ʔala d-asʔile
 Sarah est one few must answer correctly on questions

This LF composes as the formula in (31), which is identical to the formula in (26) we derived for the corresponding example with negation shown in (24). This analysis therefore

correctly captures the synonymy of (23) and (24).

$$(31) \quad \{d \mid \neg \Box \text{Sarah answers } d\text{-questions correctly}\} \supset \{d \mid \exists x \neq \text{Sarah } \neg \Box x \text{ answers } d\text{-questions correctly}\}$$

The derivation above treats the superlative ACCAC and *?alil* as two distinct elements in the syntactic structure, i.e., there is no term *a?all* in the structure, no degree phrase meaning ‘least’. This facet of the analysis of *a?all* appears to be promising for the analysis of a salient but unexpected reading of examples like (32), which native speakers also judge to be true in the situation in (4). The informativeness of (32) in the context in (4) makes sense if (32) asserts that Muna is ‘least’ in terms of how many mistakes she can make *at most* on the second test, before she falls below 12 correct answers and fails the class, which is the case in the situation in (4). This is what Sharvit and Stateva (2002) call an ‘at most upstairs de dicto’ reading of ‘least’, because we are comparing the classmates in terms of the *largest* number of mistakes they can afford to make.

$$(32) \quad \text{muna } a?all \text{ wa}hde \text{ } l\bar{a}zim \text{ t-s}\bar{a}wi \quad axt\bar{a} \quad b\text{-}^o\text{l-fa}h\text{ṣ} \quad t\text{-}t\bar{a}ni.$$

Muna least one-FS must 3FS-make mistakes on-the-test the-second
‘Muna needs to make the fewest mistakes on the second test.’

Example (32) has exactly the same format as (23), consisting of a subject, *a?all waḥde*, *lāzim*, and predicate containing a degree argument. But if we compose (32) in the same manner as (23) as illustrated in (27)-(30), we get only the same ‘at least’ reading that (23) displays, which, however, makes no sense in the context in (4). In particular, we derive the formula in (33) (derivation not shown, but parallel to (27)-(30)).

$$(33) \quad \{d \mid \neg \Box \text{Muna makes } d\text{-mistakes}\} \supset \{d \mid \exists x \neq \text{Muna } \neg \Box x \text{ makes } d\text{-mistakes}\}$$

This formula is true when the set of degrees such that it is not necessary for Muna to make that many mistakes is a superset of the set of degrees such that someone other than Muna doesn’t have to make that many mistakes. But no one has to make any mistakes at all. So ‘one’ is a degree such that Muna does not have to make that many mistakes, as is ‘two’, ‘three’, etc., up to ten. But other participants in the contexts are in the same situation,

and so no one’s degree set, so defined, is a superset of anyone else’s, meaning this reading is contradictory in the situation in (4). Yet, the sentence (32) is judged felicitous and true in the situation in (4). Although the linear composition of (32) does not give us the salient attested ‘at most’ reading, the structural separation of the superlative ACCAC *wāḥid(e)* from the underlying negative adjective *ʔalīl* posited above gives us the tools to construct a scope splitting analysis of the ‘at most’ reading of such sentences, which I flesh out in the following section.

4.1 Scope splitting

Native speakers judge (32), repeated in (34a) below, to assert the same thing as (34b); both are grammatical and describe the situation in (4). In (34b), the positive superlative *aktar waḥde* ‘most one’ co-occurs with negation, but the negation occurs below the modal, not above it as in (24). Negation manifests itself here again as *mā* rather than *mū*, since it occurs before a verb.

- (34) a. *muna aʔall waḥd-e lāzim t-sāwi axṭā b-ʔl-faḥṣ t-tāni.*
 Muna least one-FS must 3FS-make mistakes on-the-test the-second
 ‘Muna needs to make the fewest mistakes on the second test.’
- b. *muna aktar waḥd-e lāzim mā t-sāwi axṭā b-ʔl-faḥṣ t-tāni.*
 Muna most one-FS must not 3FS-make mistakes on-the-test the-second
 ‘Muna needs to make the fewest mistakes on the second test.’

Composing the sentence in (34b) in the order of elements that occur there yields the LF in (35).

- (35) *muna ACCAC waḥde λdλx lāzim mā t-sāwi x d-axṭā.*
 Muna est one must not make mistakes

This LF derives the formula in (36).

- (36) $\{d \mid \Box \neg \text{Muna make } d\text{-mistakes}\} \supset \{d \mid \exists x \neq \text{Muna } \Box \neg x \text{ make } d\text{-mistakes}\}$

The formula in (36) is true in the situation in (4). Muna can make one or two mistakes and still pass the class. But if she makes three mistakes, she fails. So in every possible world

in which she passes, she does *not* make 3 mistakes, nor 4, 5, etc., through ten. Consequently, the set of degrees such that Muna does *not* make that many mistakes in any world in which she passes the class is the set {3, 4, 5, 6, 7, 8, 9, 10}. The set of degrees such that Sami does not make that many mistakes in any world in which he passes is {5, 6, 7, 8, 9, 10}. The set of degrees such that Sarah does not make that many mistakes in any world in which she passes is {9, 10}. Muna’s set is a superset of the others, so the claim comes out true in this context, which accords with the intuitions of native speakers.

In light of this result, one possible analysis of the problematic sentence in (34a) is that it has an LF corresponding to the surface order of constituents in (34b). If that is so, then at LF, *aʔall* splits into a superlative component, which scopes above the modal, and a negative component, which scopes below it. Drawing on the hypothesis that *aʔall* consists of the superlative template as defined in (20) and *ʔalīl* as defined in (11a), the relevant reading can be derived by generating ACCAC and *ʔalīl* below the modal, then raising ACCAC above it, much as Stateva (2000) proposes for English. In Arabic, ACCAC raises overtly, but not before it is filled in with the consonantal root of *ʔalīl*, giving the impression that the negative component contributed by the base *ʔalīl* is above the modal, when in fact the two have split prior to the surface structure.

The derivation alluded to above begins by applying *ʔalīl* to a degree predicate abstracted over the verb phrase.

(37) ʔalīl λ*d* tsāwi muna *d*-axṭā.
 few make Muna mistakes

Next, ACCAC *waḥde* applies to the structure. It will move later, but it is at this stage that ACCAC *waḥde* is structurally local to *ʔalīl*, so that the morphological fusion of *ʔalīl* with the template ACCAC can take place (not shown).

(38) ACCAC waḥde ʔalīl λ*d* tsāwi muna *d*-axṭā.
 est one few make Muna mistakes

Subsequently, the modal is merged and the subject raised.

- (39) muna λx lāzim ACCAC waḥde ?alīl λd tsāwi x d -axṭā.
Muna must est one few make mistakes

Finally, the superlative raises above the subject abstraction index corresponding to λx in (40), leaving a degree-denoting trace next to the degree predicate derived by ?alīl.

- (40) muna ACCAC waḥde $\lambda d' \lambda x$ lāzim d' ?alīl λd tsāwi x d -axṭā.
Muna est one must few make mistakes

This structure composes as the formula in (41), which is the same as (36), for the corresponding sentence in (34b) with *aktar waḥde* above the modal in the surface word order and negation below the modal. This analysis therefore correctly captures the synonymy of (34a) and (34b).

- (41) $\{d \mid \Box \neg \text{Muna make } d\text{-mistakes}\} \supset \{d \mid \exists x \neq \text{Muna} \Box \neg x \text{ make } d\text{-mistakes}\}$

According to this approach, both the superlative and the negative components of *a?all* are base generated below the modal. Only the superlative component raises above the modal, but due to the superficial morphological fusion of ?alīl with the superlative template ACCAC prior to the surface structure, both appear above the modal in the surface structure. This analysis is essentially the same as the corresponding analysis of English proposed by Stateva (2000), modelled after Rullmann’s (1995) similar analysis of the comparative. According to this analysis, *fewest* in the English counterpart to (34a), shown in (1a) and repeated in (42a), splits apart into a superlative and negative component at LF. The superlative component raises above the modal, while the negative component remains in situ, deriving the LF in (42b). The analysis of Arabic described above differs from this analysis only superficially: the negative component fuses morphologically with the superlative component prior to spell out, but they remain syntactically distinct, so that the superlative component ACCAC is able to move independently of the negative operator represented by ?alīl prior to spell out, deriving displacement of what looks like the *a?all*, but syntactically is just ACCAC corresponding to *-est*.

- (42) a. Mona needs to make the fewest mistakes.

- b. Mona -est_d needs to make *d*-few mistakes.

It is significant, therefore, that there are compelling reasons to be skeptical of this analysis for Arabic. The analysis does not extend to an additional set of facts. Insofar as the analysis fails to correctly deal with Arabic, it casts a shadow over the parallel analysis of English. I ultimately provide an alternative analysis that is compatible with both the Arabic and English pattern.

4.2 Modality and Negation

In this section, I show that the split scope reading of (32) is an instance of a general pattern of inverse scope between a modal and negation in Syrian Arabic, and this pattern requires a different analysis from that sketched in the previous section.

The clausal negation particle *mā* may precede or follow the modal *lāzim* (in the form of *mū* when preceding). But there is an asymmetry in its interpretation depending on its position. When negation precedes the modal, it may be interpreted optionally either above the modal, i.e., in situ, or below the modal. But when negation follows the modal, it may only be interpreted in situ, below the modal. In fact, the ‘low’ reading of negation preceding *lāzim* in the surface structure is quite salient. In his detailed descriptive grammar of Syrian Arabic, Cowell (1964) remarks on the effect: “Logically, *mū lāzim* should mean ‘needn’t’ or ‘it is not necessary’, while ‘mustn’t’ or ‘shouldn’t’ would be expressed as *lāzim mā*. . . . Actually, however, *mū lāzim* usually means ‘mustn’t, shouldn’t, ought not to’” (p. 387).

For example, (43a) is naturally understood to mean that \$75,000 is the upper limit on your income to take the tax deduction in question, and is judged to be synonymous—on this interpretation—with (43b) with negation below the modal in the surface order. This example shows that the negative particle *mū* in (43a) may have scope below the modal, as seen overtly in (43b).

- (43) a. *mū lāzim yi-kūn daxl-ak aktar min \$75,000 mfān t-āxud*
 not must 3MS-be income-your more than \$75,000 to 2S-take

ha-l-iḥfā ḍ-ḍarībi.
 this-the-exemption the-tax

- (i) ‘Your income must not be more than \$75,000 to take this tax exemption.’
- (ii) #‘It is not necessary that your income be more than \$75,000 to take this tax exemption’

- b. lāzim mā yi-kūn daxl-ak aktar min \$75,000 mḥān t-āxud
 must not 3MS-be income-your more than \$75,000 to 2S-take
 ha-l-iḥfā ḍ-ḍarībi.
 this-the-exemption the-tax
 ‘Your income must not be more than \$75,000 to take this tax exemption.’

In principle, another reading of (43a) is available corresponding to the surface order of negation and modal, that asserts that it is not necessary for your income to be over \$75,000 to take the exemption. This reading is pragmatically awkward because it is generally not necessary for your income to be *over* a certain amount to receive a tax exemption. However, we can tell this scopal order is available because it gives us the salient reading of (44a), which asserts that it is not necessary to have advanced degree to take the job in question. Cowell’s assessment that the order NEG>MODAL ‘usually’ has inverse scope should therefore not be construed to imply that there is anything marginal about the surface scope reading. Of course, we can infer on the basis of the naturalness of (43a) that another reading is available for (44a) that asserts that it is necessary to *not* have an advanced degree to take the job, as (44b) asserts unambiguously, though this is pragmatically militated against because there are generally not upper limits on the kind of degree necessary to do a job.

- (44) a. mū lāzim yi-kūn ḥand-ak jahāde ḥālye mḥān t-āxud ha-l-waḥīfe.
 not must 3MS-be at-you degree advanced to 2S-take this-the-job
 (i) #‘You need to not have an advanced degree to take this job.’
 (ii) ‘You don’t need to have an advanced degree to take this job.’
- b. #lāzim mā yi-kūn ḥand-ak jahāde ḥālye mḥān t-āxud ha-l-waḥīfe.
 must not 3MS-be at-you degree advanced to 2S-take this-the-job
 #‘You need to not have an advanced degree to take this job.’

When negation appears overtly below the modal, things are more restricted. Example (43b) is a pragmatically natural sentence putting an upper bound on one’s income to take a certain tax exemption. Though an inverse reading meaning that it is not necessary to

earn so much to take the exemption is unnatural, the interpretation of (44b) shows that this potential reading is truly semantically unavailable. (44b) has *only* the unnatural reading corresponding to the surface scopal order of modal and negation, the reading asserting that having a higher degree disqualifies you from taking the job. The pragmatically natural potential inverse scope reading—that it is not necessary to have a higher degree—is not available here.

This means that negation cannot scope over the modal when it appears under it in the surface order, but can scope under the modal if it appears above it in the surface order (in addition to its in situ reading above the modal). Accordingly, the negation that occurs below the modal in the ‘overt splitting’ example in (34b), repeated in (45a) below, can be placed above negation with the same meaning, as in (45b). (45a) and (45b) both describe the situation in (4) equally well. But so does (32), repeated in (45c), with *aʔall* ‘least’ instead of *aktar...mā* ‘most...not’. All the sentences in (45) have a reading in common that is felicitous and true in the context in (4), one in which negation scopes below the modal but the superlative scopes above it. It appears that the possibility for negation to precede the modal but be interpreted below it correlates with the availability of what I analyzed in section 4 as structural scope splitting.

- (45) a. muna aktar waḥde lāzim mā t-sāwi axṭā.
 Muna most one-FS must not 3FS-make mistakes
 ‘Muna needs to make the fewest mistakes.’
 b. muna aktar waḥde mū lāzim t-sāwi axṭā.
 Muna most one-FS not must 3FS-make mistakes
 ‘Muna needs to make the fewest mistakes.’
 c. muna aʔall waḥde lāzim t-sāwi axṭā.
 Muna least one-FS must 3FS-make mistakes
 ‘Muna needs to make the fewest mistakes.’

Additional facts support this correlation. Modals other than *lāzim* are not transparent to negation, and also do not support split scope readings of adverbial *aʔall*. The existential modal verb *ʔidir* ‘can’ does not allow a preceding negative particle to be interpreted below it. For example, (46a) is judged by native speakers to be contradictory; it asserts that

participation is prohibited yet optional. This is the interpretation that corresponds to the surface order of negation and the modal verb. If negation could scope below the modal in this sentence, then (46a) could have the meaning attributed by native speakers to (46b), which is not contradictory; it asserts that one is able to not participate in the project, since participation is voluntary.

- (46) a. #mā b-ti-ʔdir t-fārik b-^ol-maʔrūf liʔannu l-muʔārake
 not IND-2MS-can 2MS-participate in-the-project since the-participation
 xtiyāriyye.
 optional
 #‘You can’t participate in the project, since participation is optional.’
- b. b-ti-ʔdir mā t-fārik b-^ol-maʔrūf liʔannu l-muʔārake
 IND-2MS-can not 2MS-participate in-the-project since the-participation
 xtiyāriyye.
 optional
 ‘You are able to not participate in the project, since participation is optional.’

The example in (47a) presents a context in which the order *not*>*can* is felicitous. The inverse order shown in (47b) is judged infelicitous. It asserts that Sami’s ability to *not* eat peanuts is due to an allergy, but having an allergy would seem to warrant the stronger claim that he is not able to eat peanuts. That is just the claim that the inverse scope reading would make, corresponding to the surface order seen in (47a), which is felicitous. The fact that (47b) is infelicitous means that it cannot be read as asserting what (47a) means. In summary, all the sentences in (46) and (47) with the modal verb *ʔidir* display only the surface scopal reading of the negation and the modal verb.

- (47) a. sāmi mā b-yi-ʔdir y-ākul l-fustaʔ liʔannu b-yi-tḥassas
 Sami not IND-3MS-can 3MS-eat the-peanuts because IND-3MS-be.allergic
 minn-u.
 from-them
 ‘Sami can’t eat peanuts since he is allergic to them.’
- b. #sāmi b-yi-ʔdir mā y-ākul l-fustaʔ liʔannu b-yi-tḥassas
 Sami IND-3MS-can not 3MS-eat the-peanuts because IND-3MS-be.allergic
 minn-u.
 from-them
 #‘Sami is able to not eat peanuts because he is allergic to them.’

Accordingly, though (48a) and (48b) are both grammatical, they are not synonymous. (48a) is judged true in the situation in (4), while (48b) implies that the speaker has a poor opinion of Sarah’s ability to pass the upcoming test, which does not rhyme together with the situation in (4), which depicts Sarah as the best student. These conclusions are fleshed out in more detail below. The fact that (48b) is not compatible with what (4) depicts means that the negative component of *aʔall* cannot be interpreted below the modal in (48b), where it is in (48a).

- (48) a. *sāra aktar waħd-e b-ti-ʔdir mā t-ʔāwib ʃaħħ ʔala asʔile.*
 Sarah most one-FS IND-3FS-can not 3FS-answer correctly on questions
 ‘The number of questions that Sarah can afford to not answer correctly is greater than the number of questions that anyone else can afford to not answer correctly.’
- b. *sāra aʔall waħd-e b-ti-ʔdir t-ʔāwib ʃaħħ ʔala asʔile.*
 Sarah least one-FS IND-3FS-can 3FS-answer correctly on questions
 ‘The number of questions Sarah is able to answer correctly is less than the number of questions anyone else is able to answer correctly.’

The sentence in (48a) has the LF sketched in (49).

- (49) *sāra ACCAC waħde λdλx btiʔdir mā tʔāwib x ʃaħħ ʔala d-asʔile.*
 Sarah est one can not answer correctly on questions

This structure composes as the formula in (50). It is true when the set of degrees such that Sarah is able (i.e., can afford) to not answer that many questions correctly is a superset of the set of degrees such that someone else can afford to not answer that many questions correctly. Sarah cannot get more than eight questions wrong. So the set of degrees such that Sarah can afford to get that many questions wrong is {1, 2, 3, 4, 5, 6, 7, 8}. The corresponding sets for Sami and Muna are {1, 2, 3, 4} and {1, 2} respectively. So Sarah’s set is a superset of the others, meaning this claim is true, which matches the judgments of native speakers.

- (50) $\{d \mid \diamond \neg \text{Sarah answers } d\text{-questions correctly}\} \supset \{d \mid \exists x \neq \text{Sarah } \diamond \neg x \text{ answers } d\text{-questions correctly}\}$

But again, (48b), repeated in (51a) below, may only express the notion that the speaker

has a poor opinion of Sarah’s ability to get a good grade on the test, which is not supported by the situation in (4) and is not what (48a) means, as (50) makes clear. Rather, (48b)/(51a) is synonymous with (51b), where *aktar...ma* ‘most...not’ occurs above the modal, as expected. This confirms that just as *?idir* does not allow clausal negation preceding it to be interpreted following it, it also does not allow the negative component of *a?all* preceding it to be interpreted below it. The fact that (48a) and (48b) are not synonymous shows that a split scope reading for *a?all* tracks the transparency of the modal to negation.

- (51) a. *sāra a?all waḥd-e b-ti-?dir t-3āwib ṣaḥḥ ʔala as?ile.*
 Sarah least one-FS IND-3FS-can 3FS-answer correctly on questions
 ‘The number of questions Sarah is able to answer correctly is less than the number of questions anyone else is able to answer correctly.’
- b. *sāra aktar waḥd-e mā b-ti-?dir t-3āwib ṣaḥḥ ʔala as?ile.*
 Sarah most one-FS not IND-3FS-can 3FS-answer correctly on questions
 ‘The number of questions Sarah is able to answer correctly is less than the number of questions anyone else is able to answer correctly.’

Furthermore, the transparency of *lāzim* ‘must’ to negation is not universal to the Arabic dialects. Dr. Rashid Al-Balushi, a linguist and native speaker of Omani Arabic, has reported to me that he and other native speakers of the Omani dialect he surveyed do not perceive ambiguities in the scopal order of *lāzim* ‘must’ and negation in that dialect, and this scopal rigidity extends to *?aqall* ‘least’ (=Syrian *a?all*). For example, (52a) in Omani Arabic does not have a pragmatically felicitous reading, unlike its Syrian counterpart in (43a). The only reading available is the surface scopal order which asserts that it is not necessary for your income to be over \$75,000 to take the tax exemption in question. This statement is puzzling because it denies something that would not normally be the case anyway—a tax exemption for earners over \$75,000. The other logically possible reading—found in Syrian but not Omani—asserts that it is necessary for your income to not be over \$75,000 to take the exemption. The fact that the sentence is judged odd means that the pragmatically informative scopal order with the modal over negation is not available. Similarly, (52b) is judged pragmatically infelicitous because it makes the unusual claim that you have to not

have an advanced degree to take the job in question. The other scopal order would make more pragmatic sense, but that reading is unavailable. The case of (52b) is as in Syrian, where the order MODAL>NEG is not reversible at LF. The main difference between Omani and Syrian is that in Omani Arabic, the order NEG>MODAL is also not reversible. That is, negation never displays inverse scope with respect to a modal.

- (52) a. #mā lāzim yi-kūn daxl-ak ʔakθar min \$75,000 ʔafān t-ḥaṣṣil
not must 3MS-be income-your more than \$75,000 to 2S-get
ha-l-iʔfāʔ ʔ-ʔarībi.
this-the-exemption the-tax
#‘It is not necessary for your income to be more than \$75,000 to take this tax
exemption’. [Omani]
- b. #lāzim mā yi-kūn ʔand-ak jahāda ʔālya ʔafān t-ḥaṣṣil ha-l-waḏīfah.
must not 3MS-be at-you degree advanced to 2S-get this-the-job
#‘You need to not have an advanced degree to take this job.’ [Omani]

In Omani, the distribution of the superlative is the same as in Syrian, but the exact counterpart of example (32) with the split scope reading in Syrian does not have the split scope reading in Omani, illustrated in (53). Rather, it asserts that Muna is obligated to make a certain number of mistakes, which is pragmatically implausible.⁶

- (53) #muna ʔaqaḷl wāhida lāzim t-sāwi ʔaxṭāʔ f-ʔl-imtihān θ-θāni.
Muna least one-FS must 3FS-make mistakes in-the-test the-second
#‘The number of mistakes Muna is obligated to make on the second test is less than
the number of mistakes anyone else is obligated to make.’ [Omani]

These observations mean that the possibility of a split scope reading for *aʔall* tracks the transparency of the modal to negation across modals and across dialects. This means that the possibility of interpreting negation in (43a) below the modal and the possibility of the split scope reading of (32) have the same source. In principle, this could be an operation that vacuously raises negation from below the modal to a position above it in the surface structure, without changing its scope, or it could be an operation that non-vacuously lowers negation from above the modal to a position below it at LF, changing its scope.

⁶The glottal stop in Syrian *aʔall* corresponds to a uvular stop [q] in Classical Arabic which is preserved in Omani. Also in Omani, negative *mā* has no alternative form.

The analysis proposed in section 4.1 is neither of these things. According to that analysis, the split scope reading of (32) arises in the following way. Both the superlative morpheme ACCAC and negation in the form of *?alīl* are generated below the modal, then the superlative component raises, leaving the negative component behind. Negation only appears to precede the modal because the superlative ACCAC has already fused morphologically with *?alīl* before it raises. The possibility of split scope is not encoded as a property of the modal, but rather as a property of the superlative—that the superlative may raise in the surface structure in Arabic, having already fused with negation. But the superlative may appear before the existential modal *?idir* ‘can’ as well, as for example (48a) shows, with the superlative above *?idir* and negation below it. But if that configuration is grammatical, we expect the corresponding construction with *a?all* to be grammatical, where the superlative is base generated together with *?alīl* under the modal then raises (after vacuous morphological fusion with *?alīl*) above the modal, generating (48b) with the meaning of (48a). But we have observed this is not possible.

We desire a unified analysis of the possibility of a split scope reading of *a?all* across a modal and the possibility of interpreting negation occurring above a modal in the surface order below it in the semantic representation. A literal lowering analysis must be able to lower both the negative degree predicate modifier *?alīl* (negative component of *a?all* in the split scope examples like (32)) and negation itself (in examples like (43a)). Here is one possibility. Let us attribute the category NegP to *mā* ‘not’ and *?alīl* ‘little’, and make NegP the specifier of a polarity projection Σ P after Laka (1990). There is a Σ P projection both above and below the position of the modal verb. As a specifier, NegP may undergo phrasal movement to a higher Σ P. Movement of NegP from the lower Σ P to the higher Σ P is accompanied by insertion of an abstraction operator, as usual for movement. But in this case, the abstraction operator has the same semantic type as the moved element, with the result that movement is vacuous: lambda-reduction will put the the moved NegP back in the scope of the modal. The LF of (45b), repeated in (54a) below, is schematized in (54b).

Lambda reduction has the effect of lowering $m\bar{u}$ into the position of the variable X below the modal. What is special about the modal $\bar{l}\bar{a}z\bar{i}m$ on this account is that it allows higher-type lambda abstraction across it, facilitating reconstruction, while $\bar{?}i\bar{d}i\bar{r}$ does not.

- (54) a. muna aktar waḥd-e mū $\bar{l}\bar{a}z\bar{i}m$ t-sāwi axtā.
 Muna most one-FS not must 3FS-make mistakes
 ‘Muna needs to make the fewest mistakes.’
 b. Muna ACCAC waḥde $\lambda d\lambda x$ [Σ_P mu $\langle t,t \rangle$ $\lambda X_{\langle t,t \rangle}$ $\bar{l}\bar{a}z\bar{i}m$ [Σ_P X tsāwi x d -axtā
 Muna est one not must make mistakes
]].

For the case of the split scope reading of $a\bar{?}al\bar{l}$, as in example (45c), repeated in (55a) below, we want to reconstruct the negating adjective $\bar{?}al\bar{l}$ ‘little’ underlying $a\bar{?}al\bar{l}$ ‘least’ to a position under the modal. The abstraction operator must therefore be of the same type as $\bar{?}al\bar{l}$, that of degree predicate modifier, as shown in (55b).

- (55) a. muna a $\bar{?}al\bar{l}$ waḥd-e $\bar{l}\bar{a}z\bar{i}m$ t-sāwi axtā.
 Muna least one-FS must 3FS-make mistakes
 ‘Muna needs to make the fewest mistakes.’
 b. Muna ACCAC waḥde $\lambda d'\lambda x$ [Σ_P $\bar{?}al\bar{l}_{\langle \langle d,t \rangle, \langle d,t \rangle \rangle}$ $\lambda X_{\langle \langle d,t \rangle, \langle d,t \rangle \rangle}$ $\bar{l}\bar{a}z\bar{i}m$ d' [Σ_P X λd
 Muna est one few must
 tsāwi x d -axtā]]
 make mistakes

On this view, the reason why this reconstruction is possible with universal $\bar{l}\bar{a}z\bar{i}m$ ‘must’ and not with existential $\bar{?}i\bar{d}i\bar{r}$ ‘can’ is because $\bar{l}\bar{a}z\bar{i}m$ allows a higher type (i.e., non-individual-type) abstraction dependency to cross over it, while $\bar{?}i\bar{d}i\bar{r}$ does not. Crucially, the possibility of negation-lowering and split scope (i.e., $\bar{?}al\bar{l}$ -lowering) are fundamentally properties of the modal according to this view, not of the superlative or of negation, which accords with the observation that only $\bar{l}\bar{a}z\bar{i}m$ allows inverse scope of negation. But what is it, exactly, about the universal modal $\bar{l}\bar{a}z\bar{i}m$ that allows a ‘reconstruction chain’ to cross over it, in contrast to which $\bar{?}i\bar{d}i\bar{r}$ does not allow this? And why would the language avail itself of the opportunity to raise negation or $\bar{?}al\bar{l}$ in the first place, if only to put it back in its base position at LF?

I do not see any obvious answer to this question. It appears that this analysis, though

not empirically objectionable, lacks explanatory power, in that it restates the question of why *lāzim* but not *?idir* allows split scope readings as the question of why *lāzim* but not *?idir* is transparent to vacuous displacement of negation. As far as this analysis goes, it could have been the other way around. This raises the question of whether any aspect of this phenomenon can be connected to any other respect in which universal modals behave differently from existential modals. I describe below a potential connection.

4.3 Modal Ambiguity

Suppose that the modal *lāzim* is actually ambiguous between an existential interpretation and a universal interpretation, and the universal interpretation occurs obligatorily by default, whenever the modal fails to occur in an environment that allows the existential interpretation. The ambiguity arises in the scope of *mā* ‘not’ and *?alīl* ‘little’, and is perhaps a sensitivity to the underlying logical operator ‘ \neg ’ that both introduce to the semantic representation. Below, I refer to *mā* and *?alīl* collectively as NEG.⁷ I hypothesize that *lāzim* has the meaning in (56) (again ignoring the fact that the world quantifiers ‘ \diamond ’ and ‘ \square ’ are restricted by a modal base). According to this definition, NEG optionally selects the existential reading, while the universal reading occurs elsewhere, including under NEG when the existential option is not taken.

- (56) $\llbracket \text{lāzim} \rrbracket =$
- a. $\lambda p. \diamond p$ optionally when locally c-commanded by NEG
 - b. $\lambda p. \square p$ elsewhere

According to this analysis, the ‘at most’ (i.e., ‘split scope’) reading of (32)/(55a), has the same syntactic structure as the ‘at least’ reading of (23)—ACCAC and *?alīl* both scope above the modal in both cases. The ‘at most’ reading of (32) correlates not with reconstruction of

⁷The meaning of *?alīl* (again, the denotation that Heim 2006 attributes to ‘little’) is related to the meaning of *mā* ‘not’ by the Geach Rule. This rule is a lift that converts a category $\langle \alpha, \beta \rangle$ to the category $\langle \langle \gamma, \alpha \rangle, \langle \gamma, \beta \rangle \rangle$ for any category γ (Geach 1972). Here, $\alpha = \beta = t$ and $\gamma = d$. Though the two are lexicalized differently (*mā* lexicalizes $\langle t, t \rangle$ and *?alīl* lexicalizes $\langle \langle d, t \rangle, \langle d, t \rangle \rangle$), it may fundamentally be *mā* ‘not’ that allows the existential reading of *lazim* to surface, while *?alīl* admits it by virtue of being a derivative of *mā*.

ʔalīl but with the existential interpretation of *lāzīm*. The difference in interpretation is due to the optionality that the negative component of *aʔall*—the underlying adjective *ʔalīl*—triggers. In the presence of *ʔalīl*, *lāzīm* may be interpreted as either a universal or existential modal. If *lāzīm* is interpreted as the universal modal in (56b), we derive for (23) the same ‘at least’ upstairs de dicto reading we derived previously, repeated in (57a). But if *lāzīm* is interpreted as the existential modal in (56a), which is possible in the context of *ʔalīl*, then we derive for the puzzling ‘at most’ upstairs de dicto example (32) the denotation in (57b). According to this analysis, (23) and (32) share the same syntactic structure, and neither displays reconstruction of negation.

- (57) a. $\{d \mid \neg \Box \text{Sarah answers } d\text{-questions correctly}\} \supset \{d \mid \exists x \neq \text{Sarah } \neg \Box x \text{ answers } d\text{-questions correctly}\}$
 b. $\{d \mid \neg \Diamond \text{Muna makes } d\text{-mistakes}\} \supset \{d \mid \exists x \neq \text{Muna } \neg \Diamond x \text{ makes } d\text{-mistakes}\}$

That (57a) represents the correct truth conditions for the ‘at least’ upstairs de dicto example in (23) has been discussed previously. I claimed above that the truth conditions for the ‘at most’ upstairs de dicto example (32) can be expressed by an LF in which the superlative occurs above the modal but negation below it. But due to the equivalence of $\neg \exists$ and $\forall \neg$, (57b) is true in the same circumstances. In the situation in (4), Muna will fail if she makes more than two mistakes. So the set of degrees such that it is not possible for Muna to make that number of mistakes and still pass the class starts at three; it is the set $\{3, 4, 5, 6, 7, 8, 9, 10\}$. The set of degrees such that it is not possible for Sami to make that many mistakes and still pass is $\{5, 6, 7, 8, 9, 10\}$. Sarah’s set is $\{9, 10\}$. Since Muna’s set is a superset of the others, (57b) comes out true on this LF, as desired.

In this and other cases, this analysis matches the predictions of the vacuous NEG-raising analysis. The two differ in the source of the ‘split scope’ (i.e. ‘at most’ upstairs de dicto) reading of *aʔall* ‘least’. In the vacuous raising analysis, NEG can raise vacuously around *lāzīm*, generating split scope readings in the same manner as the inverse scope reading for *mū lāzīm* ‘not must’. On the modal ambiguity approach, the modal may be interpreted as

an existential quantifier over worlds in the immediate context of NEG, also explaining ‘split scope’ for *aʔall* and ‘inverse scope’ for *mū lāzim* in terms of the same generalization.

Two things speak in favor of the modal ambiguity analysis over the vacuous NEG-raising analysis. Both analyses raise the question of why the universal modal allows this ambiguity and not the existential modal. It is also clear that this is not a universal property of universal modals, not even within the Arabic dialects. Iatridou and Zeijlstra (2013) and Zeijlstra (2017) point out that in many languages, some deontic universal modals are positive polarity items (PPIs); they are blocked from negative environments and if they occur with negation at all, they obligatorily scope above the negation. English *must* is such an element: *He must not leave* cannot mean that it is not necessary for him to leave (cf. *He cannot leave*, which displays the same word order but means he is not able to leave). Iatridou and Zeijlstra remark that there are no existential modals that are PPIs, i.e., which, in a negative context, must scope above negation. The Arabic modal *lāzim* is not a PPI, since *mū lāzim* is grammatical and systematically may mean that *It is not necessary that...* But there is nonetheless an abstract resemblance between Iatridou and Zeijlstra’s generalization and the behavior of *lāzim*: when *lāzim* occurs in the scope of negation, it may optionally weaken to an existential quantifier. In doing so, it avoids a configuration in which a universal modal occurs in the scope of negation by converting the universal quantifier into an existential one. The modal ambiguity analysis makes the phenomenon an instance of the generalization ‘avoid $\neg\forall$ ’ in the domain of modals, which manifests itself elsewhere as a polarity sensitivity on some universal modals in some languages. Existential modals are not subject to this condition in any form, and accordingly do not accommodate split scope readings of *aʔall* in Arabic, as the discussion of (47) and (48) showed.

A further consideration in favor of the analysis in (56) is that the weakening of *lāzim* to an existential quantifier in the context of negation has the effect of strengthening the meaning of the sentence as a whole, and is therefore an instance of the ‘Strongest Meaning Hypothesis’ developed by Dalrymple et al. (1998), drawing on elements of Grice’s (1975)

‘Maxim of Quantity’ and Heim’s (1991) ‘Maximize Presupposition’. Dalrymple et al. present an analysis of reciprocals in which these are lexically ambiguous between several readings, and the reading that is attested in any given context is the strongest meaning compatible with that context, where a meaning A is stronger than a meaning B is A entails B. Sauerland et al. (2005), Spector (2007), Farkas and de Swart (2010), and others apply variations on this theme to the interpretation of plurals. The behavior of *lāzim* differs from reciprocals and plurals in that the ambiguity of *lāzim* is not always resolved: *lāzim* remains ambiguous between an existential and universal reading in the scope of NEG; it is only unambiguous in positive environments. And there, it is indefeasibly unambiguous. This suggests that the forces governing the interpretation of *lāzim* are not pragmatic in nature, but grammatical. The conditions on the interpretation of *lāzim* in (56) are a kind of grammaticalized strongest meaning pattern. The pattern is incomplete, since strengthening in negative contexts remains optional. Yet the interpretation of *lāzim* partially mimics the effect of the Strongest Meaning Hypothesis: where the optionality is obligatorily resolved, namely in positive contexts, it is the stronger, universal, reading that is attested, and the existential reading that is available in negative environments represents, in combination with negation, a strengthening of the meaning of the sentence as a whole vis a vis the universal reading of *lāzim*. Here, again, the analysis of *lāzim* in (56) relates the Arabic facts to these other phenomena.

The vacuous NEG-raising analysis does not connect split scope for *aʔall* ‘least’ and inverse scope for *mū lāzim* ‘not must’ to any other phenomena. The fact that *lāzim* ‘must’ but not *ʔidir* ‘can’ allows vacuous NEG-raising bears no relation to the fact that cross-linguistically, some universal modals must not occur in the scope of negation, nor to other cases in which lexical ambiguities resolve in the direction that strengthens the meaning of the sentence. The fact that existential modals permit neither scope splitting for *aʔall* ‘least’ nor inverse scope for *mū lāzim* ‘not must’ is a coincidence from this perspective. I take this point to support the modal ambiguity analysis.

Recall that Stateva (2000) proposes a scope-splitting-by-movement analysis of similar

English facts. An analysis in this style does not work for Arabic because it fails to capture the generalization that *a?all* preceding a modal may show scope splitting over the modal just when the modal allows inverse scope with a preceding negation, meaning the phenomenon has nothing to do with the scope of the superlative. A theory that makes the scope splitting effect an ambiguity in the interpretation of the modal that arises in the context of negation captures this generalization. If the scope-splitting-by-movement analysis does not extend to Arabic, it raises the question of whether the modal ambiguity analysis extends to English.

English modals are generally not scopally ambiguous with respect to negation; a given word order consistently displays either one scopal order or the other. In terms of the modal ambiguity analysis, this means that negation does not allow an existential reading for *need* or other universal modals along the lines of what I have proposed for Arabic. (58) cannot mean that it is not possible for Sarah to answer many questions correctly. As a result, the scope splitting facts in English do not fit into a broader generalization about the scope of negation and modality.

(58) Sarah does not need to answer many questions correctly.

This means that a particular empirical fact motivating the modal ambiguity analysis for Arabic is not available in English, but neither does it contradict the modal ambiguity analysis for English *least*. If English *least* raises to a position above the modal, optionally triggering an existential reading of the modal, then English *least* is parallel to Arabic *a?all* ‘least’. The fact that English *not* is not parallel to Arabic *mā* in this respect could be taken to mean that *not* does not belong to the category of terms that trigger the ambiguity in English. That *not* and *little* (underlying *least*) are distinct syntactic categories with distinct semantic types leaves room for them to affect universal modals differently. Consequently, some languages might conflate them on account of their similarity (*little* is a lifted derivative of *not* in my analysis, see footnote 7) or treat them differently on account of their dissimilarities (*little* and *not* belong to different syntactic and semantic types). I propose that both Arabic and

English *aʔall/little* optionally trigger an existential reading of a universal modal. Arabic *mā* does the same, but English *not* does not. I expand on this idea in the following section, which integrates the results of section 4 on *aʔall* ‘least’ with those of section 3 on *ʔalīl* ‘little’.

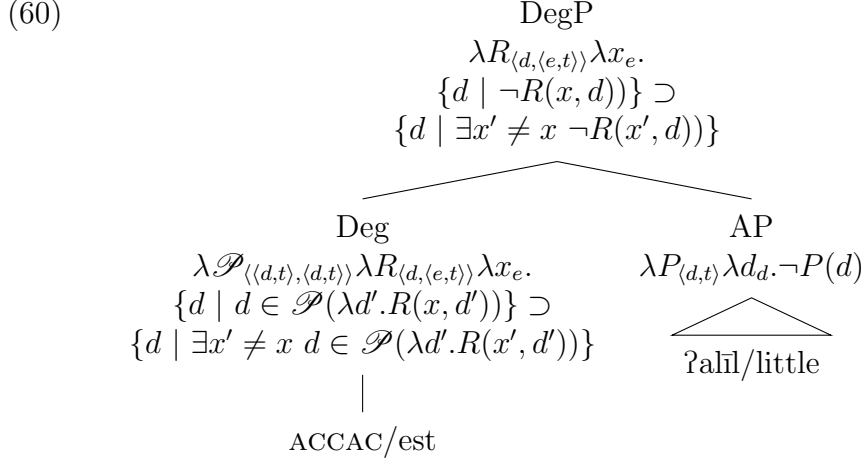
5 On the relation of *least* to *little* in English and Arabic

In the analysis of Arabic above, I claimed that the superlative morpheme ACCAC ‘est’ and the negative adjective *ʔalīl* ‘little’ are two distinct morphemes, that head distinct projections in the syntax. This syntax was originally postulated as part of an analysis in which *ʔalīl* moves from a degree argument position adjacent to its associate to a higher position, over which the superlative ACCAC is then applied, feeding morphological fusion of ACCAC and *ʔalīl*, potentially followed by further movement of ACCAC (now in the form of *aʔall*). But in the modal ambiguity analysis, the superlative morpheme ACCAC and the base adjective *ʔalīl* never split. They occur together in Arabic where they are interpreted, and in so far as they move there, they move together as a constituent. If English is identical to Arabic in this respect, so that the effect of scope splitting is really an ambiguity in the interpretation of the modal, then the adjectival and superlative components of English *fewest* do not split either.

It remains the case that in both Arabic and English, *aʔall/least* is morphologically complex, consisting of a superlative morpheme ACCAC/*est* and an adjectival base *ʔalīl/little*. These observations call for an analysis of the combinatorial properties of ACCAC/*est* and *ʔalīl/little* that fuses them together in the base structure and moves them to a scope position as a unit. I have defined the meaning of *ʔalīl* on analogy to Heim’s (2006) and Büring’s (2007a, 2007b) definition for *little*, repeated in (59a). I define the superlative ACCAC/*est* as in (59b), giving it an additional degree predicate argument, which is *ʔalīl/little* in the case of *aʔall/least* and vacuous *ktīr/many* in the case of *aktar/most*.

- (59) a. $\llbracket ?al\bar{i}l/little \rrbracket = \lambda P_{\langle d,t \rangle} \lambda d_d. \neg P(d)$
 b. $\llbracket ACCAC/est \rrbracket = \lambda \mathcal{P}_{\langle \langle d,t \rangle, \langle d,t \rangle \rangle} \lambda R_{\langle d, \langle e,t \rangle \rangle} \lambda x_e. \{d \mid d \in \mathcal{P}(\lambda d'. R(x, d'))\} \supset \{d \mid \exists x' \neq x. d \in \mathcal{P}(\lambda d'. R(x', d'))\}$

The combination of ACCAC/*est* and *?alil/little* is shown in (60).⁸



On this approach, the morphological fusion in Arabic of superlative ACCAC with the base adjective *?alil* takes place in the syntactic sisterhood relation, an added advantage over the analyses considered previously, where ACCAC and *?alil* were structurally more distant. If we define *ktir/much* as the vacuous degree predicate modifier (61) (Solt 2015), then in combination with ACCAC/*est* we arrive at a denotation for *aktar* ‘most’ identical to (60) except without the negation sign ‘ \neg ’ (not shown), i.e., the positive counterpart to *a?all/least*.

(61) $\llbracket kt\bar{i}r/much \rrbracket = \lambda P_{\langle d,t \rangle} \lambda d_d. P(d)$ (Solt 2015)

In the interpretation of the adverbial superlative *a?all wāhid(e)* and *aktar wāhid(e)*, one possibility is that the nominal component *wāhid(e)* ‘one-(FS)’ is vacuous, as I have claimed previously. Another possibility is that it is an anaphor whose content is borrowed from the syntactic context at LF, which then fills the *R* argument slot of the superlative sketched in

⁸The denotation of DegP in (60) is arrived at in two reduction steps:

- (i) a. $\lambda R_{\langle d, \langle e,t \rangle \rangle} \lambda x_e. \{d \mid d \in [\lambda P_{\langle d,t \rangle} \lambda d_d. \neg P(d)](\lambda d'. R(x, d'))\} \supset \{d \mid \exists x' \neq x d \in [\lambda P_{\langle d,t \rangle} \lambda d_d. \neg P(d)](\lambda d'. R(x', d'))\}$
 b. $\lambda R_{\langle d, \langle e,t \rangle \rangle} \lambda x_e. \{d \mid d \in \lambda d'. \neg R(x, d')\} \supset \{d \mid \exists x' \neq x. d \in (\lambda d'. \neg R(x', d'))\}$

(60).

On this view, the structure of the ‘at most’ upstairs de dicto example in (32) (the ‘scope splitting’ example) is derived as shown in (62). The subject of comparison moves to a scope position, accompanied by insertion of an abstraction index over individuals, and the superlative moves to a position between the subject and its abstraction index, accompanied by insertion of an abstraction index over degrees.

(62) muna ACCAC(*ʔalīl*) waḥde $\lambda d \lambda x$ lāzim tsāwi x *d*-axṭā.
 Muna est(little) one must make mistakes
 ‘Muna needs to make the fewest mistakes.’

Since in this structure, *ʔalīl* ‘little’ locally *c*-commands *lāzim* ‘must’, the latter may be interpreted as an existential quantifier over worlds in which Mona passes the class, yielding the interpretation in (63).

(63) $\{d \mid \neg \diamond \text{Muna makes } d\text{-mistakes}\} \supset \{d \mid \exists x \neq \text{Muna} \neg \diamond x \text{ makes } d\text{-mistakes}\}$

The set of degrees such that there is no possible world in which Muna passes the class and makes that many mistakes is the set $\{3, 4, 5, 6, 7, 8, 9, 10\}$ (there are worlds in which she passes in which she makes one or two mistakes, but none in which she makes more). The corresponding sets for Sami and Sarah are $\{5, 6, 7, 8, 9, 10\}$ and $\{9, 10\}$ respectively. Since Muna’s set is a superset of the others’ sets, this claim is true, as desired. The possibility of retaining the universal reading of the modal in the same syntactic context yields the structure in (64b) for (23), repeated in (64a) below (the same structure as in (62)), but the denotation in (64c).

(64) a. sāra aʔall waḥd-e lāzim t-ʔāwib ṣaḥḥ ʔala asʔile.
 Sarah least one-FS must 3FS-answer correctly on questions
 ‘Sarah needs to answer the fewest questions correctly.’
 b. sāra ACCAC(*ʔalīl*) waḥde $\lambda d \lambda x$ lāzim tʔāwib x ṣaḥḥ ʔala *d*-asʔile.
 Sarah est(little) one must answer correctly on questions
 c. $\{d \mid \neg \square \text{Sarah answers } d\text{-questions correctly}\} \supset \{d \mid \exists x \neq \text{Sarah} \neg \square x \text{ answers } d\text{-questions correctly}\}$

The set of degrees such that Sarah does not necessarily answer that many questions

correctly in *all* the worlds in which she passes is $\{3, 4, 5, 6, 7, 8, 9, 10\}$ (she must get two questions right, but not necessarily more). The corresponding sets for Sami and Muna are $\{7, 8, 9, 10\}$ and $\{9, 10\}$ respectively. Since Sarah’s set is a superset of the others, this claim comes out as true as well in the context in (4), as desired.

If the modal ambiguity analysis extends to English, then in English, too, superlative *est* and the adjective *little* do not split at LF. Rather, *least* as defined in (60) raises to a scope position above the modal, like in Arabic. The only difference between Arabic and English is that in Arabic, this displacement is overt, while in English it is covert.

In section 3, I applied Heim’s (2006) analysis of English *few* as [POS *few*] to Arabic. Heim claims that POS is generated in the degree argument position of the associated degree predicate (e.g. *few*) and raises at LF, leaving a degree denoting trace behind, as in (65) for a sentence like *Mary has few friends*.

$$(65) \quad \text{POS}_i [d_i \text{ few}]_j [\text{Mary has } d_j\text{-friends}].$$

The fact that the superlative morpheme in Arabic does not split from its degree predicate-modifier base points to a parallel analysis of POS as a function of a degree predicate-modifier.

$$(66) \quad \llbracket \text{POS} \rrbracket^c = \lambda \mathcal{P}_{\langle \langle d,t \rangle, \langle d,t \rangle \rangle} \lambda P_{\langle d,t \rangle} . L_c \subseteq \mathcal{P}(P)$$

In combination with *?alil*, the denotation in (67) results.

$$(67) \quad \begin{array}{c} \text{DegP} \\ \lambda P_{\langle d,t \rangle} . L_c \subseteq \lambda d . \neg P(d) \\ \swarrow \quad \searrow \\ \begin{array}{cc} \text{Deg} & \text{NegP} \\ \lambda \mathcal{P}_{\langle \langle d,t \rangle, \langle d,t \rangle \rangle} \lambda P_{\langle d,t \rangle} . L_c \subseteq \mathcal{P}(P) & \lambda P_{\langle d,t \rangle} \lambda d . \neg P(d) \\ | & \triangle \\ \text{POS} & \text{?alil} \end{array} \end{array}$$

According to the analysis presented above, both English POS(*little*) and Arabic POS(*?alil*) should also optionally trigger the existential reading of the modals *need to* and *lāzim* respectively. I show below that the positive counterparts of *?alil*/*little* do not yield a coherent

interpretation when they select the existential interpretation of the modal. Consequently, although I claim the ambiguity persists in these cases also, they are not perceived to be ambiguous, because one of the readings is systematically contradictory.

Take the case of (5a), repeated in (68), and its English translation there.

- (68) sāra lāzim t-ʒāwib ʃaħħ ʕala asʕile ʔalīl-e.
 Sarah must 3FS-answer correctly on questions few-PL
 ‘Sarah needs to answer few questions correctly.’

Raising of *ʔalīle* (in the form of POS(*ʔalīl*)) yields the LF in (69), if we interpret *lāzim* as a universal quantifier over worlds (restricted by the modal base of, in this case, worlds in which Sarah passes the class).

- (69) POS(*ʔalīl*) λd [\square tʒāwib sāra ʃaħħ ʕala *d*-asʕile]
 POS(little) answers Sarah correctly on questions

This LF yields the denotation in (70). The set of degrees such that Sarah does not need to answer that many questions correctly is $\{3, 4, 5, 6, 7, 8, 9, 10\}$. The claim that the neutral zone is within this set means that the number of questions she needs to answer correctly is below the neutral zone, as desired.

- (70) $L_c \subseteq \lambda d. \neg \square$ Sarah answers *d*-questions correctly

Now suppose we choose the existential interpretation of the modal, as the analysis proposed here allows us to do. Then the LF of (68) will look like (71a) and its interpretation will be (71b).

- (71) a. POS(*ʔalīl*) λd [\diamond tʒāwib sāra ʃaħħ ʕala *d*-asʕile]
 POS(little) answers Sarah correctly on questions
 b. $L_c \subseteq \lambda d. \neg \diamond$ Sarah answers *d*-questions correctly

One possible outcome of the test is that Sarah gets all ten questions right. In that outcome, she also gets 9 questions right, and 8, etc. As a result, there is no degree such that there is *no* positive outcome in which she gets that many questions right, since in one positive outcome she gets all ten right. As a result, the set of degrees such that there is no

possible world in which Sarah passes and answers that many questions correctly is the null set. The only way the ‘neutral zone’ L_c could be a subset or equal to the null set is if it were also the null set. But it seems reasonable to attach a presupposition to the definition of POS that L_c may not be empty, since otherwise it would not fulfil the function of delineating a subinterval of the degree interval it applies to (once combined with a ‘polarity’ marker *kt̄ir/much* or *?al̄il/little*). If this is correct, (71b) fails to meet this presupposition and the interpretation of *l̄azim* as an existential modal in (68) makes (68) a presupposition failure. So we do not expect to perceive an ambiguity between a universal and existential interpretation of *l̄azim* in the context of POS(*?al̄il*), even if the existential interpretation is in principle available.

In this analysis, POS (or ACCAC/*est* in the case of the superlative) takes a specification of polarity *kt̄ir/much* or *?al̄il/little* as argument to derive a degree quantifier. This degree quantifier has a behavior distinct from negative quantifiers like *wala ḥada* ‘no one’ discussed in section 3. The latter must be licensed by clausal negation in Arabic (see (8)), but not the former. Further, according to the analysis proposed here, the scope of negation is actually fixed in the surface structure in Arabic—the illusion of lowering of *mā* in the context of *l̄azim* is analyzed here as an ambiguity in the meaning of *l̄azim* itself, not in the scope of negation. But *?al̄il* may be interpreted above a clausemate modal verb even when it follows it in the surface structure. In the present analysis, this is an instance of raising of a degree quantifier to a scope position, which is not subject to the language’s constraints on the placement of negation. This analysis of *?al̄il* as a positive degree quantifier captures discrepancies in the behavior of *?al̄il* and negative quantifiers.

6 Conclusion

This paper has presented a scope puzzle in Syrian Arabic and surveyed three possible analyses. The term *a?all* ‘least’ may occur above a universal modal but in that position may

yield a reading identical to one in which the positive counterpart *aktar* ‘most’ occurs above the modal and negation occurs below it. One analysis of Arabic resembles a scope splitting analysis of the English translational equivalents: the superlative raises in the surface structure, after it has morphologically fused with negation, but leaving the semantic locus of negation below the modal. This analysis fails in view of a broader set of data: only the universal modal allows scope splitting, though the superlative may scope over an existential modal. Further, even clausal negation may be interpreted below the modal when it precedes it in the surface order. This points instead to a NEG-lowering analysis, in which negation preceding the modal may be lowered to a position below it, whether in the form of the negative component of *aʔall* ‘least’ or clausal negation itself. But this analysis, too, fails to provide any insight into why only the universal modal is transparent to negation in this way, and not the existential modal.

This contrast lends credence to a third analysis of the scope splitting facts, one in which the ambiguity is located in the modal. If the universal modal becomes ambiguous with an existential modal in the scope of negation, then the various interpretations of constructions with *aʔall* fall out naturally. Further, the weakening of the universal modal to an existential one in the context of NEG can be seen as a case of resistance to the scopal order ‘ $\neg\forall$ ’ or as a case of preference for the strongest sentence-level meaning, as found in other constructions. This predicts that the existential modal will not display any scope splitting ambiguities, which is the case. The analysis of Arabic extends to English, except that unlike *little* and *least*, *not* does not support the ambiguity in the interpretation of *need to* or other universal modals. This means that the Arabic pattern is not inherent in negation as such cross-linguistically, nor is the ambiguity of the modal a cross-linguistic universal.

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